ATTACHMENT J.4.1

ARARS AND TBCS REQUIREMENTS

ATTACHMENT J.4.1

CRITICAL APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS DETERMINATIONS

This attachment presents a summary of identified ARARs and TBCs associated with the remediation of the Silo 3 material. These ARARs and TBCs were approved by the U.S. EPA and OEPA as part of the Record of Decision for Remedial Actions at Operable Unit 4, December 7, 1994. The selected Contractor must manage the Silo 3 material as classified by the FEMP and in accordance with the ARARs identified in this attachment.

Some ARAR determinations warrant a more detailed discussion. Detailed discussions of the principal hazardous waste, radioactive waste, and state ARAR determinations that were identified as potential ARARs are presented in this section.

Hazardous Waste - Resource Conservation Recovery Act

The material contained in Silo 3 is 11(e)(2) byproduct material resulting from the processing of uranium ore and is specifically exempt, as defined, from regulation as solid waste under RCRA 40 CFR Part 261.4(a)(4). The referenced exclusion applies to "source, special nuclear or byproduct material as defined in the AEA of 1954 as amended, 42 U.S.C. 2011 *et seq*." The AEA defines byproduct material as: "(1) any radioactive material (except special nuclear material) yielded in or made radioactive by exposure to the radiation incident to the process of producing or utilizing special nuclear material, and (2) the tailings or waste produced by the extraction or concentration of uranium or thorium from any ore processed primarily for its source material content" [AEA Section 11(e)(1) and (2)]. Since a material must first be a solid waste in order to be a hazardous waste, and since the material is excluded from regulation as solid waste, the subject material cannot be considered hazardous waste. It should be noted that the words "any radioactive material" as used in the definition for 11(e)(1) byproduct material refers only to the actual radionuclides dispersed or suspended in the waste substance. Nonradioactive hazardous components of 11(e)(1) byproduct material are subject to the RCRA regulations for management as hazardous waste (10 CFR Part 962 Byproduct Material).

By definition, Silo 3 material is not 11(e)(1) byproduct material. The radioactive material in the Silo 3 material was neither yielded in nor made radioactive during processing. The radioactive material in the Silo 3 material is inherent to the ore from which the uranium was extracted. Silo 3 material was not generated as a result of producing or utilizing special nuclear material. Special nuclear material is defined as "(1) plutonium, uranium enriched in the isotope 233 or in the isotope 235, and any other material which the Commission, pursuant to the provisions of Section 51 [42 U.S.C. 2071], determines to be special nuclear material, but does not include source material; or (2) any material artificially enriched by any of the foregoing, but does not include source material" [AEA Section 11(aa)(1) and (2)]. Silo 3

material was generated from the extraction of uranium not from the production of plutonium nor the enrichment of U-233 or U-235. In addition, special nuclear material is utilized in nuclear reactors. Silo 3 material was not generated in a nuclear reactor. Therefore, Silo 3 material does not meet the definition of 11(e)(1) byproduct material.

Silo 3 material falls under the 11(e)(2) classification of byproduct material. Silo 3 only contains material from the chemical extraction (beneficiation) of uranium from ores; no other solid or hazardous wastes were added to the silos or to the material. Therefore, the contents of Silo 3 are pure "byproduct materials" by definition, and not solid wastes or hazardous wastes subject to regulation under RCRA. The metals found in the material were present in the natural ore, and were unintentionally extracted from the parent ore along with the uranium during the process of beneficiation, becoming more concentrated in the waste after the uranium was removed. The presence of naturally occurring metals is expected in byproduct material, and does not invalidate either the definition or the exclusion. In addition, no metals from a non-ore source were added to the stream at any point in the beneficiation process. Also, no hazardous waste or waste constituent was added or created at any time during the beneficiation process. The fact that several metals in the material fail the RCRA TCLP does not cause the material to become subject to RCRA regulation due to a hazardous waste characteristic, since the metals are not from an external source, but are associated with the parent material (whose wastes, including any ancillary metals, are excluded from the definition of solid waste).

Because Silo 3 material is classified as byproduct material as defined under the AEA of 1954 and is excluded from the definition of solid waste, requirements under RCRA are not applicable. However, based on Extraction Procedure Toxicity results conducted and reported in the Operable Unit 4 Remedial Investigation, leachate from the Silo 3 material exceed the toxicity characteristic limits for arsenic, cadmium, chromium, and selenium established for hazardous waste in 40 CFR Part 261.24. These metals pose a potential threat to impact groundwater that may be used for human consumption. The material is sufficiently similar to hazardous waste regulated by RCRA and some RCRA requirements are relevant and appropriate for management of the Silo 3 material.

As stated previously, relevant and appropriate requirements that are identified for alternatives involving off-site disposal activities must be met for only the on-site portions of those alternatives. In addition, on-site actions are required to comply only with the substantive parts of an ARAR. Therefore, only the substantive parts of RCRA requirements identified as ARARs need to be met for the alternatives that identify on-site treatment of Silo 3 material followed by off-site disposal.

In addition, soil and debris may also exhibit a hazardous waste characteristic due to contamination by the Silo 3 material that would require management as a hazardous waste under RCRA. Any other solid waste generated pursuant to remediation would require characterization in accordance with 40 CFR Part 262.11 under RCRA prior to disposal.

Relevant and appropriate RCRA closure requirements are promulgated at 40 CFR Part 264 Subpart G. These regulations contain the RCRA closure performance standard and incorporate the unit type closure requirements by reference. Tank systems may be used to store or treat Silo 3 material during remediation. Thus, the closure requirements for tank units in 40 CFR Part 264.197 are potential ARARs.

Facilities regulated under Subtitle C of RCRA that are undergoing remedial or corrective action may designate specific areas of the facility property for the management of remediation waste. These remedial waste management areas, known as corrective action management units (CAMUs), are allowed under 40 CFR Part 264, Subpart S, in order to provide flexibility during the process of remediation. Remediation wastes include both solid and hazardous wastes, as well as media and debris which may be contaminated with a hazardous waste. The CAMU may be designated for functional purposes as long as protectiveness is assured; in the case of this document, by meeting the threshold criteria of acceptable risk, and compliance with identified ARARs. Contaminated media and debris generated during the remediation of Silo 3 material may be managed in a CAMU, or moved between CAMUs without triggering the applicability of the Land Disposal Restrictions (LDRs) which prohibit placement of hazardous wastes in the land disposal units unless the waste has been treated to certain levels or by using specified technologies.

Land Disposal Restrictions

As stated previously, Silo 3 material are classified as 11(e)(2) byproduct material under the AEA of 1954. As byproduct material, Silo 3 material is exempt from regulation under RCRA. However, the substantive parts of certain RCRA requirements were identified as "relevant and appropriate" requirements for on-site activities for alternatives involving off-site disposal.

The treatment of the Silo 3 material would be considered a substantial part of the RCRA requirements. Treatment is defined under 40 CFR Part 260.10 as "any method, technique, or process, including neutralization, designed to change the physical, chemical, or biological character or composition of any hazardous waste so as to neutralize such waste, or so as to recover energy or material resources from the waste, or so as to render such waste nonhazardous, or less hazardous; safer to transport; store, or dispose of; or amenable for recovery, amenable for storage, or reduced in volume."

Although the AEA 11(e)(2) byproduct material can be blended with other nonhazardous waste material through its exclusion from RCRA requirements, the identification of "relevant and appropriate" requirements that reference the dilution prohibition under RCRA prohibit the blending of Silo 3 material, with any material, as a treatment option to remove a characteristic, since RCRA and CERCLA do not recognize blending as a substitute for adequate treatment.

Blending Silo 3 material with other material would not be consistent with CERCLA section

121(b)(1) preference for a remedial alternative that "permanently and significantly reduces the volume, toxicity, or mobility of the hazardous substances or contaminated materials." This section further states, "The off-site transport and disposal of hazardous substances or contaminated materials without such treatment should be the least favored alternative remedial action where practicable treatment technologies are available."

Blending Silo 3 material with other material would neither reduce the mobility of the heavy metal constituents nor destroy the heavy metal constituents to reduce the toxicity. Blending would merely dilute the heavy metal constituents through an increase in total volume to eliminate the toxicity characteristic under RCRA. Practicable stabilization technologies are available for treating the Silo 3 material that would reduce the mobility of the heavy metal constituents and eliminate the toxicity characteristic under RCRA.

In addition, it is the opinion of FDF that blending Silo 3 material with either soil or other waste would result in Silo 3 material losing its classification as 11(e)(2) byproduct material. The intent to blend Silo 3 material with either soil or other waste with the knowledge that the material would be reclassified as low-level waste would require the material to be classified and managed as low-level waste prior to blending. Because the Silo 3 material exhibits the toxicity characteristic, classification as low-level waste would require management as a mixed waste in accordance with all RCRA requirements including the LDRs. Reclassification of Silo 3 material to low-level mixed waste would result in requirements under RCRA becoming "applicable" to the remediation of the wastes. This would also preclude blending from being considered an option for management of the wastes, since blending is not recognized as a substitute for adequate treatment.

Radioactive Waste - AEA, NRC, and UMTRCA

The material in Silo 3 is unique, concentrated uranium ore process byproducts. No single regulation exists that is both sufficiently adequate and appropriate to address the management and disposal of these wastes. Therefore, several groups of regulations that contain management and disposal requirements for radioactive wastes have been identified as "relevant and appropriate," and parts of DOE Order 5400.5 have been identified as "TBC" criteria for remedial actions involving this material. Certain requirements within these regulations are considered "relevant" to Silo 3 material on the basis of significantly similar wastes and "appropriate" because the appropriateness of the requirements' purpose to the overall goals of the remedial action. The protective requirements of the Uranium Mill Tailings Radiation Control Act (UMTRCA), the NRC regulations, and various other regulations including DOE Order 5400.5, are listed as potential ARARs or TBCs for this material.

More Stringent State Requirements

Those state requirements considered to be ARARs are: (1) promulgated such that they are of general applicability and legally enforceable, (2) identified by the state in a timely manner,

and (3) are more stringent than federal requirements [40 CFR Part 300.400(g)(4)]. Several State of Ohio promulgated requirements were identified as more stringent than the federal requirements and are potential ARARs for OU4; these potential state ARARs are discussed below.

Ohio Solid and Hazardous Waste Rules

The State of Ohio solid and hazardous waste rules vary from the federal RCRA regulations. The federal regulations define hazardous wastes as a subset of solid wastes with the AEA regulated substances specifically excluded under 40 CFR Part 261.4. Under the Ohio rules, this exclusion provided for AEA regulated substances is only from regulation as hazardous waste, defining solid waste to include the AEA regulated substance. Therefore, this Ohio regulation is more stringent than its federal counterpart.

Ohio Water Quality Standards

The State of Ohio regulations contain the following water quality standard that does not have a counterpart in the federal requirements:

- OAC 3745-1-21 assigns use designations to sections of the Great Miami River and its tributaries. Based on these use designations, OAC 3745-1-07 designates water quality standards for the section of the river that is subject to potential impact by discharges from the FEMP, both at the point of discharge and outside the mixing zone.

Other Requirements

In addition to the types and classes of ARARs described, other requirements exist that are neither ARARs nor TBCs. These other requirements do not fit into the applicable, relevant and appropriate, or TBC categories either because they are not promulgated regulations or because they are not environmental requirements subject to waiver or negotiation. This latter category includes those requirements such as site worker protection standards under the OSHA, and off-site transportation requirements found in the DOT regulations.

An example of nonpromulgated requirements include the various DOE Orders. AEA requirements for DOE's waste management are incorporated into DOE Orders, developed and issued under DOE's AEA authority. The Orders are generally consistent with, and typically include, technical requirements similar or equivalent to those in NRC regulations and that are appropriate for DOE facilities. DOE Order substantive environmental requirements that pertain to an alternative are TBC requirements, which, when included in a CERCLA ROD, are enforceable cleanup standards under CERCLA. In this document DOE Orders are identified as TBCs only when no promulgated ARAR exists, to ensure adequate protection of human health and the environment. Parts of these Orders that are considered potential TBCs are included in Tables J.4.1-1, J.4.1-2, and J.4.1-3. When an ARAR was identified that offered equivalent

protectiveness to an existing Order, the promulgated requirement was selected for inclusion in the tables instead of the DOE Order. For the alternatives described in this document, portions of DOE Order 5400.5 were selected as TBCs to ensure adequate protection of the public during and following remediation. Other DOE Orders which pertain to worker protection and safety, National Environmental Policy Act (NEPA) implementation, and quality assurance are considered "other requirements" and must be complied with during remediation of the Silo 3 material.

Table J.4.1-1 Chemical-Specific ARARs and TBCs

Category	ARAR	Requirement Assessment	Compliance Strategy	Cross Reference Index
Radionuclide Emissions (Except Airborne Radon-222)	40 CFR § 61 Subpart H Emissions of radionuclides to the ambient air from DOE facilities shall not exceed those amounts that might cause any member of the public to receive in any year an EDE of 10 mrem per year. Monitoring is required at release points having potential to discharge radionuclides which could cause an EDE in excess of 1% of the standard (0.1 mrem/yr) to any member of the public.	This requirement is applicable to remediation of Silo 3 material. Radioactive materials within Silo 3 might contribute to the dose to members of the public from the air pathway during implementation of remedial actions.		
Radon-222 Emissions	40 CFR § 61 Subpart Q No source at a DOE facility shall emit more than 20 pCi/m^{2}Cs of radon-222 as an average for the entire source during periods of storage and disposal.	This requirement is applicable only to storage and disposal of radium-bearing byproduct material, such as Silo 3 material. Storage facilities for untreated Silo 3 material or stabilized wastes might qualify as sources.		
Protection of Air from Residual Radioactive Material	DOE Order 5400.5 Chap. IV, 6.b (proposed 10 CFR § 834) Interim Storage: The above-background concentration of radon-222 in air above an interim storage facility must not exceed 100 pCi/L at any point, an annual average of 30 pCi/L over the facility, or an annual average of 3 pCi/L at or above any location outside the site.	DOE Orders are identified as TBCs only when no promulgated ARARs exist, to ensure the adequate protection of human health and the environment. Portions of DOE Order 5400.5 were selected as TBCs to ensure adequate protection of the public during and following remediation. Management of radium and thorium bearing wastes might result in the release of radon gas to the environment.		

Category	ARAR	Requirement Assessment	Compliance Strategy	Cross Reference Index
Radiation Protection of the Public and the Environment from Radionuclide Air Emissions	Doe Order 5400.5 Chap. III (proposed 10 CFR § 834) Residual concentrations of radionuclides in air in uncontrolled areas are limited to the following, (for known mixtures of radionuclides, the sum of the ratios of the observed concentrations of each radionuclide to its corresponding limit must not exceed 1.0). Derived Concentration Guide[a] (µCi/mL) Isotope / D / W / Y Actinium-227: $2x10^{-15}$ / $7x10^{-15}$ / $1x10^{-14}$ Lead-210: $9x10^{-13}$ / ----[b] / ---- Polonium-210: $1x10^{-12}$ / $1x10^{-12}$ / ---- Protactinium-231: ---- / $9x10^{-15}$ / $1x10^{-14}$ Radium-224: ---- / $4x10^{-12}$ / ---- Radium-226: ---- / $1x10^{-12}$ / ---- Radium-228: ---- / $3x10^{-12}$ / ---- Technetium-99: $1x10^{-8}$ / $2x10^{-9}$ / ---- Strontium-90[c]: $5x10^{-11}$ / ---- / $9x10^{-12}$ Thorium-228: ---- / $5x10^{-14}$ / $4x10^{-14}$ Thorium-230: ---- / $4x10^{-14}$ / $5x10^{-14}$ Thorium-232: ---- / $7x10^{-15}$ / $1x10^{-14}$ Uranium-234: $4x10^{-12}$ / $2x10^{-12}$ / $9x10^{-14}$ Uranium-235: $5x10^{-12}$ / $2x10^{-12}$ / $1x10^{-13}$ Uranium-236: $5x10^{-12}$ / $2x10^{-12}$ / $1x10^{-13}$ Uranium-238: $5x10^{-12}$ / $2x10^{-12}$ / $1x10^{-14}$ [a]D,W, and Y (days, weeks, and years) represent lung retention classes; removal halftimes assigned to the compounds with classes D, W, and Y are 0.5, 50, and 500 days, respectively. Exposure conditions assume an inhalation rate of 8,400 m^3 of air per year (based on an exposure over 24 hours per day, 365 days per year). [b]A hyphen means no limit has been established. [c]The value shown for daily DCG is for strontium radionuclides with a f_1 value of $3x10^{-1}$. The value shown for yearly DCG is for strontium radionuclides with a f_1 value of $1x10^{-2}$.	DOE Orders are identified as TBCs only when no promulgated ARARs exist, to ensure the adequate protection of human health and the environment. Portions of DOE Order 5400.5 were selected as TBCs to ensure adequate protection of the public during and following remediation. Remediation of Silo 3 material has the potential to release radionuclides that are contained in the waste materials.		

Category	ARAR	Requirement Assessment	Compliance Strategy	Cross Reference Index
Radiation Protection of the Public and the Environment from Radionuclide Release to Waters	DOE Order 5400.5 Chap. III (proposed 10 CFR § 834) Residual concentrations of radionuclides in water that may be ingested are listed below. These derived concentration guides (DCGs) for the constituents of concern (COCs) are based on a committed effective dose equivalent (CEDE) of 100 mrem/yr, assuming ingestion of 2 liters/day. Note that these DCGs apply only if ingestion is the single pathway of exposure. Isotope — Ingested Water DCGs (µCi/mL) Actinium-227 — $1x10^{-8}$ Lead-210 — $3x10^{-8}$ Polonium-210 — $8x10^{-8}$ Protactinium-231 — $1x10^{-8}$ Radium-224 — $4x10^{-7}$ Radium-226 — $1x10^{-7}$ Radium-228 — $1x10^{-7}$ Technetium-99 — $1x10^{-4}$ Strontium-90 — $1x10^{-6}$ Thorium-228 — $4x10^{-7}$ Thorium-230 — $3x10^{-7}$ Thorium-232 — $5x10^{-8}$ Uranium-234 — $5x10^{-7}$ Uranium-235 — $6x10^{-7}$ Uranium-236 — $5x10^{-7}$ Uranium-238 — $6x10^{-7}$	DOE Orders are identified as TBCs only when no promulgated ARARs exist, to ensure the adequate protection of human health and the environment. Portions of DOE Order 5400.5 were selected as TBCs to ensure adequate protection of the public during and following remediation. Remediation of Silo 3 material has the potential to release radionuclides that are contained in the waste materials to environmental media.		

Category	ARAR	Requirement Assessment	Compliance Strategy	Cross Reference Index
Ohio Water Quality Standards Use Designation and Criteria	OAC 3745-1-07 All pollutants or combinations of pollutants shall not exceed, outside the mixing zone, the Numerical and Narrative Criteria for Aquatic Life Habitat and Water Supply Use Designation listed in Tables 7-1 through 7-15 of this rule. The following COCs for OU4 have warm water habitat criteria concentrations outside the mixing zone as follows: Constituent — Criteria conc.[a] (µg/L) — 30-day average conc. (µg/L) Antimony: 650 / 190 Arsenic: 360 / 190 Beryllium: Tab. 7-10[b] / Tab. 7-11[c] Cadmium: Tab. 7-10 / Tab. 7-11 Chromium: Tab. 7-10 / Tab. 7-11 Copper: Tab. 7-10 / Tab. 7-11 Cyanide: 46 / 12 Lead: Tab. 7-10 / Tab. 7-11 Mercury: 1.1 / 0.20 Nickel: Tab. 7-10 / Tab. 7-11 Selenium: 20 / 5.0 Silver: Tab. 7-10 / 1.3 Thallium: 71 / 16 Zinc: Tab. 7-10 / Tab. 7-11 2-Butanone: 160,000 / 7,100 4-Nitrophenol: 790 / 35 Acetone: 550,000 / 78,000 Aldrin: ---- / 0.01 bis(2-ethylhexyl)phthalate: 1,100 / 8.4 Carbon tetrachloride: 1,800 / 280 DDT: ---- / 0.001 Dieldrin: ---- / 0.005 di-n-butyl phthalate: 350 / 190 Diethylphthalate: 2,600 / 120 Dimethylphthalate: 1,700 / 73 Endosulfan[d]: ---- / 0.003 Endrin: ---- / 0.002 Fluoranthrene: 200 / 8.9 Methylene chloride: 9,700 / 430 PCBs: ---- / 0.001	This requirement is applicable to remediation activities involving Silo 3 material. Paddys Run and the stream segment of the Great Miami River adjacent to the FEMP are designated as warm water aquatic life habitats with use designations of agricultural and industrial water supply, and primary contact recreation. Chemical contaminants within Silo 3 might be released during remediation such that they might contribute to contamination in these aquatic habitats. OAC 3745-1-21 (Water Use Designation for the Great Miami River) establishes the classification of the receiving waters for the FEMP.		

Category	ARAR	Requirement Assessment	Compliance Strategy	Cross Reference Index
Ohio Water Quality Standards Use Designation and Criteria (continued)	[a]Criteria concentration shall be met outside the mixing zone. [b]Criteria concentration based on hardness of water. See Table 7-10 for calculation to determine maximum concentration outside the mixing zone. [c]30-day average criteria based on hardness of water. See Table 7-11 for calculation to determine allowable 30-day average concentration outside the mixing zone. [d]No designation was made as to whether endosulfan referred to endosulfan I or endosulfan II or the sum total of each. The remaining COCs for OU4 will have criteria concentration levels based on calculated acute aquatic criteria (AAC), or chronic aquatic criteria (CAC).			
Ohio Water Quality Standards "Five Freedoms" for surface water	OAC 3745-1-04 All surface waters of the state shall be free from: • objectionable suspended solids • floating debris, oil, and scum • materials that create a nuisance • toxic, harmful or lethal substances • nutrients that create nuisance growth	This requirement is relevant and appropriate to remediation activities involving Silo 3 material. This requirement pertains to both discharges to surface waters as a result of remediation and any on-site surface waters affected by site conditions.		

Table J.4.1-2 Location-Specific ARARs and TBCs

Category	ARAR	Requirement Assessment	Compliance Strategy	Cross Reference Index
Endangered Species Protection	50 CFR § 402 ORC 1518, 1513.25 OAC 1501-18-1-01 Federal agencies must not jeopardize the continued existence of any endangered or threatened species, or destroy or adversely modify critical habitat of such species.	Although the FEMP is located within the range of the Indiana bat, a federally listed endangered species, no sighting has occurred on the FEMP. Therefore, this requirement is relevant and appropriate. Any potential impacts of the remedial actions on this species must be evaluated and appropriate actions taken.		
Compliance with Floodplain/Wetlands Environmental Review Requirements	10 CFR § 1022 Executive Order 11990 DOE actions in a wetland must first evaluate the potential adverse effects those actions might have on the wetland and consider the natural and beneficial values served by the wetlands.	This requirement is applicable because the FEMP is a DOE facility. Several alternatives might result in destruction or modification of wetland areas.		

Table J.4.1-3 Action-Specific ARARs and TBCs

Category	ARAR	Requirement Assessment	Compliance Strategy	Cross Reference Index
NEPA Evaluations	10 CFR § 1021.2 DOE actions must be subjected to NEPA evaluation as outlined by Council on Environmental Quality (CEQ) regulations in 40 CFR § 1500-1508.	This requirement is applicable because the FEMP is a DOE facility, and this requirement requires NEPA evaluation for specific actions at DOE facilities.		
Nationwide Permit Program	33 CFR § 330 The U.S. Corps of Engineers can issue a Nationwide Permit (NWP) as a general permit for certain classes of actions that involve dredge or fill activities in wetlands or navigable waters. Discharges of dredged or fill material into wetlands may require a wetland delineation.	This requirement is applicable to remediation activities that may require construction of access roads and utility lines resulting in minor wetland disturbances. All dredge and fill activities related to construction of these access roads and utility lines will be conducted in accordance with the substantive terms and conditions of NWP 14 (Road Crossing) and NWP 12 (Utility Line Backfill and Bedding). OEPA has been granted Section 401 State Water Quality Certification for NWPs 12 and 14.		
Discharge of Storm Water Runoff	40 CFR § 122.26 OAC 3745-38 Storm water runoff from landfills, construction sites, and industrial activities must be monitored and controlled. A Stormwater Pollution Prevention Plan (SWPPP) is required for construction activities which result in a total land disturbance of 5 or more acres.	This requirement is applicable to industrial waste sites and construction sites of greater than 5 acres that discharge storm water runoff to the waters of the United States. Some remedial alternatives evaluated might disturb more than 5 acres of land.		

Category	ARAR	Requirement Assessment	Compliance Strategy	Cross Reference Index
Discharge of Treatment System Effluent	40 CFR § 125.100 & 40 CFR § 125.104 Best Management Practices Develop and implement a BMP program to prevent the release of toxic or hazardous pollutants to waters of the U.S. Development and implementation of a sitewide BMP Program is also required as a condition of the FEMP NPDES Permit. The BMP program must: • Establish specific objectives for the control of toxic and hazardous pollutants • Include a prediction of direction, rate of flow, and total quantity of toxic and hazardous pollutants where experience indicates a reasonable potential for equipment failure.	All of the proposed actions have the potential for releases and runoff from this operable unit. The requirement is not applicable because BMP under the NPDES permit program applies only to ancillary facilities of manufacturing units that might have releases of toxic or hazardous pollutants. The purpose of the BMP program is relevant and appropriate to prevent releases from spills or runoff during implementation of remedial actions. The current FEMP NPDES permit does not contain a BMP Plan requirement. BMP requirements have been superseded by the SWPPP.		
Ohio Water Well Standards	OAC 3745-9-10 Abandonment of Test Holes and Wells Upon completion of testing, a test hole or well shall be either completely filled with grout or such material as will prevent contaminants from entering groundwater.	This requirement is applicable to any test borings and wells that might be installed and/or closed as part of these remedial alternatives.		
Implementation of Health and Environmental Protection Standards for Uranium Mill Tailings	40 CFR § 192 Subpart C This subpart contains guidance, criteria, and supplemental standards for compliance with Subparts A and B of 40 CFR 192.	This requirement is relevant and appropriate to remediation activities involving Silo 3 material. Radioactive materials in this operable unit are primarily byproduct residues from uranium processing. Requirements for design of controls should be consistent with design of controls for other residual radioactive materials such as mill tailings.		

Category	ARAR	Requirement Assessment	Compliance Strategy	Cross Reference Index
Hazardous Waste Determinations	40 CFR § 262.11 OAC 3745-52-11 Any generator of waste must determine whether or not the waste is hazardous. The procedures to be followed include: • To identify whether a particular material of concern is a "solid waste" • To identify whether a particular exclusion applies to the material eliminating it from definition as a "solid waste" • To identify whether a particular solid waste might be classified as a hazardous waste • To determine if a material otherwise classified as a "hazardous waste" might be excluded from RCRA regulation	These procedures are established to determine whether wastes are subject to the requirements of RCRA. The material in Silo 3 is specifically exempt from the applicability of RCRA requirements. However, these procedures are relevant and appropriate to determine whether OU4 wastes, whether excluded or not, exhibit the characteristics of hazardous waste. The material stored in the silos are sufficiently similar to hazardous wastes based on the TCLP results. Silo 3 contains material which must be treated, stored, and disposed in accordance with RCRA. Other wastes such as debris generated during decontamination (e.g., concrete scabbling), will also require a hazardous waste determination to be made.		

Category	ARAR	Requirement Assessment	Compliance Strategy	Cross Reference Index
Empty Containers	40 CFR § 261.7 OAC 3745-51-7 Containers that have held hazardous wastes are "empty" and exempt from further RCRA regulations if one or more of the of the following are met: • No more than 2.5 cm (1 inch) of residue remains on bottom of inner liner. • Less than 3% by weight of total capacity remains (less than or equal to 110 gallon container, • Less than 0.3% by weight of total capacity remains (greater than 110 gallon container) Containers that have held acutely hazardous ("P" listed) wastes are "empty" and exempt from further RCRA regulation if: • They or their inner liners have been triple rinsed with an adequate solvent or the inner liner has been removed from the container.	The material in Silo 3 is specifically exempt from the applicability of RCRA requirements. However, these procedures are relevant and appropriate since the material stored in Silo 3 is sufficiently similar to hazardous wastes based on TCLP results. (This requirement will be applicable to non-excluded solid waste that exhibit a hazardous characteristic.) Containers used to treat or store the contents of Silo 3 might contain residues which exhibit hazardous waste characteristics which must be removed before the containers might be reused or disposed.		
Generators Who Transport Hazardous Waste for Off-site Treatment, Storage, or Disposal	40 CFR § 262.20 - 262.33 and 263.20 - 263.31 OAC 3745-52-20 through 33 and OAC 3745-53-20 through 31 Any generator who transports hazardous waste for off-site treatment, storage or disposal must originate and follow-up the manifest for off-site shipments.	The material in Silo 3 is specifically exempt from the applicability of RCRA requirements. However, these procedures are relevant and appropriate since the material stored in Silo 3 is sufficiently similar to hazardous wastes based on TCLP results. (This requirement will be applicable to non-excluded solid waste that exhibit a hazardous characteristic.) Any wastes determined to be RCRA hazardous waste removed from this operable unit for off-site treatment, storage, or disposal might be subject to the manifest requirement.		

Category	ARAR	Requirement Assessment	Compliance Strategy	Cross Reference Index
Treatment, Storage, or Disposal Facility Standards	40 CFR § 264 Subpart B OAC 3745-54-13 through 16 General Standards • Waste Analysis - OAC 3745-54-13 Operators of a facility must obtain a detailed chemical and physical analysis of a representative sample of each hazardous waste to be treated, stored, or disposed of at the facility prior to treatment, storage, or disposal. • Security - OAC 3745-54-14 Operators of a facility must prevent the unknowing or unauthorized entry of persons or livestock into the active portions of the facility, maintain a 24-hour surveillance system, or surround the facility with a controlled access barrier and maintain appropriate warning signs at facility approaches. • Inspections - OAC 3745-54-15 Operators of a facility must develop a schedule and regularly inspect monitoring equipment, safety and emergency equipment, security devices and operating and structural equipment that are important to preventing, detecting or responding to environmental or human health hazards, promptly or immediately remedy defects, and maintain an inspection log. • Training - OAC 3745-54-16 Operators must train personnel within 6 months of their assumption of duties at a facility in hazardous waste management procedures relevant to their positions including emergency response training.	The material in Silo 3 is specifically exempt from the applicability of RCRA requirements. However, these procedures are relevant and appropriate since the material stored in Silo 3 is sufficiently similar to hazardous wastes based on TCLP results. (This requirement will be applicable to non-excluded solid waste that exhibit a hazardous characteristic.) Wastes, which exhibit a characteristic similar to RCRA hazardous waste, removed from this operable unit might be treated, stored, and disposed in accordance with TSD facility standards.		

Category	ARAR	Requirement Assessment	Compliance Strategy	Cross Reference Index
Treatment, Storage, or Disposal Facility Preparedness and Prevention	40 CFR § 264 Subpart C OAC 3745-54-31 through 35 and OAC 3745-54-17 OAC 3745-54-31 - TSD operators must design, construct, maintain, and operate facilities to minimize the possibility of a fire, explosion, or any unplanned sudden or nonsudden release of hazardous waste to air, soil, or surface water which might threaten human health or the environment. OAC 3745-54-32 - All facilities must be equipped with an internal communication or alarm system, a telephone, or a two-way radio for calling outside emergency assistance, fire control, spill control, and decontamination equipment and water at an adequate volume and pressure to supply water hose streams, foam producing equipment, automatic sprinklers, or water spray systems. OAC 3745-54-33 - All fire protection and spill control and decontamination equipment and communication and alarm systems must be tested and maintained as necessary to assure proper emergency operation. OAC 3745-54-34 - All personnel must have immediate access to emergency communication or alarm systems whenever hazardous waste is being handled at the facility. OAC 3745-54-35 - Aisle space must be sufficient to allow unobstructed movement of personnel, fire and spill control, and decontamination equipment. OAC 3745-54-37 - Operators must attempt to make arrangements, appropriate to the waste handled, for emergency response by local and state fire, police and medical personnel.	The material in Silo 3 is specifically exempt from the applicability of RCRA requirements. However, these procedures are relevant and appropriate since the material stored in Silo 3 is sufficiently similar to hazardous wastes based on TCLP results. (This requirement will be applicable to non-excluded solid waste that exhibit a hazardous characteristic.) Wastes removed from this operable unit might be treated, stored, or disposed in accordance with TSD facility standards.		

Category	ARAR	Requirement Assessment	Compliance Strategy	Cross Reference Index
Treatment, Storage, or Disposal Facility Contingency Plan and Emergency Procedures	40 CFR § 264 Subpart D OAC 3745-54-51 through 52 and OAC 3745-54-55 through 56 OAC 3745-54-51 - Each facility operator must have a contingency plan designed to minimize hazards to human health or the environment due to fires, explosions, or any unplanned releases of hazardous waste constituents to the air, soil, or surface/groundwater. OAC 3745-54-52 - Contingency plans should address procedures to implement a response to incidents involving hazardous waste, and provide for internal and external communications, arrangements with local emergency authorities, and emergency coordinator list, a facility emergency equipment list indicating equipment descriptions and locations, and a facility personnel evacuation plan. OAC 3745-54-55 through 56 - Each facility must have an emergency coordinator who has responsibility for coordinating all emergency response measures, is on the premises or on call at all times, is thoroughly familiar with all aspects of the contingency plan, facility operations, location and characteristics of waste handled, location of pertinent records, and facility layout, and who has the authority to commit the resources necessary to implement the contingency plan in the event of an emergency.	The material in Silo 3 is specifically exempt from the applicability of RCRA requirements. However, these procedures are relevant and appropriate since the material stored in Silo 3 is sufficiently similar to hazardous wastes based on TCLP results. (This requirement will be applicable to non-excluded solid waste that exhibit a hazardous characteristic.) Wastes removed from this operable unit might be treated, stored, or disposed in accordance with TSD facility standards.		
Closure	40 CFR § 264 Subpart G OAC 3745-55-11, 3745-55-14, and 3745-55-16 Operators must close the facility in a manner that: • Minimizes the need for further maintenance • Minimizes post-closure escape of hazardous constituents • Complies with specific unit type closure requirements All contaminated equipment, structures and soils must be properly disposed or decontaminated. Following closure, a survey plot showing the location of hazardous waste disposal units with respect to surveyed benchmarks must be filed with the legal total zoning authority.	The material in Silo 3 is specifically exempt from the applicability of RCRA requirements. However, these procedures are relevant and appropriate since the material stored in Silo 3 is sufficiently similar to hazardous wastes based on TCLP results. The Contractor's facility must be clean closed, else media remediation to meet closure performance standard. (This requirement will be applicable to non-excluded solid waste that exhibit a hazardous characteristic.)		

Category	ARAR	Requirement Assessment	Compliance Strategy	Cross Reference Index
Container Storage	40 CFR § 264 Subpart I OAC 3745-55-71 through 78 Containers of RCRA hazardous waste must be: • Maintained in good condition • Compatible with hazardous waste to be stored • Closed during storage (except to add or remove waste) • Managed in a manner that will not cause the container to rupture or leak Storage areas must be inspected weekly for leaking and deteriorated containers and containment systems. Place containers on a sloped, crack-free base, and protect from contact with accumulated liquid. Provide a containment system with a capacity of 10 percent of the volume of the largest container of free liquids. Remove spilled or leaked waste in a timely manner to prevent overflow of the containment system. Keep incompatible materials separate. Separate incompatible materials stored near each other by a dike or other barrier. At closure, remove all hazardous waste and residue from the containment system, and decontaminate or remove all containers, liners, bases, and soils.	The material in Silo 3 is specifically exempt from the applicability of RCRA requirements. However, these procedures are relevant and appropriate since the material stored in Silo 3 is sufficiently similar to hazardous wastes based on TCLP results. (This requirement will be applicable to non-excluded solid waste that exhibit a hazardous characteristic.) These requirements are relevant and appropriate for alternatives utilizing containers for temporary storage or storage before disposal.		

Category	ARAR	Requirement Assessment	Compliance Strategy	Cross Reference Index
Tank Systems	40 CFR § Subpart J OAC 3745-55-91 through 96 Design, operating standards, and inspection requirements for tank units within which hazardous waste is stored or treated. • Tank design must be compatible with the material being stored. • Tank must be designed and have sufficient strength to store or treat waste to ensure it will not rupture or collapse. • Tank must have secondary containment that is capable of detecting and collecting releases to prevent migration of wastes or accumulated liquids to the environment.	The material in Silo 3 is specifically exempt from the applicability of RCRA requirements. However, these procedures are relevant and appropriate since the material stored in Silo 3 is sufficiently similar to hazardous wastes based on TCLP results. (This requirement will be applicable to non-excluded solid waste that exhibit a hazardous characteristic.) Design criteria, operating standards, and inspections for tank treatment units might be relevant and appropriate for alternatives utilizing treatment or storage in a tank prior to disposal.		
Closure Requirements for Tanks	40 CFR § 264.197 OAC 3745-55-97 At closure, the facility owner must do the following: • Remove all waste residues • Remove or decontaminate all tank system components • Remove or decontaminate all contaminated soils and structures • Manage all of the above as hazardous wastes • If all contaminated soils cannot be removed, the landfill requirements of 40 CFR § 264.310 apply.	These standards pertain to closure of any tanks and appurtances used to store or treat Silo 3 material during remediation. These requirements are relevant and appropriate because the circumstances and material subject to potential release are similar to those RCRA is designed to address.		

Category	ARAR	Requirement Assessment	Compliance Strategy	Cross Reference Index
Miscellaneous Units	40 CFR § 264 Subpart X OAC 3745-57-91 through 92 Environmental performance standard, monitoring, inspection, and post-closure care for treatment in miscellaneous units as defined in 40 CFR § 260.10.	The material in Silo 3 is specifically exempt from the applicability of RCRA requirements. However, these procedures are relevant and appropriate since the material stored in Silo 3 is sufficiently similar to hazardous wastes based on TCLP results. (This requirement will be applicable to non-excluded solid waste that exhibit a hazardous characteristic.) Miscellaneous units might be utilized under various alternatives to remediate waste that is sufficiently similar to hazardous waste.		
Corrective Action for SWMUs	40 CFR Subpart S 40 CFR § 264.552, . 553 Corrective Action Management Units might be designated at the site as areas where remediation wastes (solid, hazardous, or contaminated media and debris) might be placed during the process of remediation. Temporary units consisting of tanks and container storage units might be used to store and treat hazardous waste during the process of corrective action.	The material in Silo 3 is specifically exempt from the applicability of RCRA requirements. However, these procedures are relevant and appropriate since the material stored in Silo 3 is sufficiently similar to hazardous wastes based on TCLP results. (This requirement will be applicable to non-excluded solid waste that exhibit a hazardous characteristic.) During the process of remediation, materials might require temporary management for the purpose of staging or treating the material. Some of the material might exhibit a RCRA characteristic, or otherwise be sufficiently similar to hazardous waste to make this requirement relevant and appropriate.		

Category	ARAR	Requirement Assessment	Compliance Strategy	Cross Reference Index
Containment Buildings	40 CFR § 264 Subpart DD Hazardous waste and debris might be placed in units known as containment buildings for the purpose of interim storage or treatment. Containment buildings must be fully enclosed to prevent exposure to the elements and ensure containment of managed wastes. Floor and containment walls must be designed and constructed of materials of sufficient strength and thickness to support themselves, the waste contents, and any personnel and heavy equipment that operate within the operable unit. All surfaces coming in contact with hazardous waste must be chemically compatible with the waste. Primary barriers must be constructed to prevent migration of hazardous constituents into the barrier. Secondary containment systems including secondary barrier and leak detection systems must also be constructed for containment buildings used to manage wastes containing free liquids. Controls must be implemented to ensure: the primary barrier is free of significant cracks, corrosion, or other deterioration that may allow release of hazardous waste; the level of hazardous waste does not exceed height of containment walls and is otherwise maintained within containment walls; tracking of waste out of unit by personnel or equipment used in handling waste is prevented, and fugitive dust emissions are controlled at level of no visible emissions.	The material in Silo 3 is specifically exempt from the applicability of RCRA requirements. However, these procedures are relevant and appropriate since the material stored in Silo 3 is sufficiently similar to hazardous wastes based on TCLP results. (This requirement will be applicable to non-excluded solid waste that exhibit a hazardous characteristic.) During the process of remediation, materials might require temporary management for the purpose of staging or treating the material. Some of the material might exhibit a RCRA characteristic, or otherwise be sufficiently similar to hazardous waste to make this requirement relevant and appropriate.		
Radiation Dose Limit (All Pathways)	DOE Order 5400.5, Chapter II, Section 1.a (proposed 10 CFR §834) The exposure of members of the public to radiation sources as a consequence of all routine DOE activities shall not cause, in a year, an effective dose equivalent greater than 100 mrem from all exposure pathways.	DOE Orders are identified as TBCs only when no promulgated ARARs exist, to ensure adequate protection of human health and the environment. Portions of DOE Order 5400.5 were selected as TBCs to ensure adequate protection of the public during and following remediation. Radiation sources within this operable unit might contribute to the total dose to members of the public from this DOE facility.		

Category	ARAR	Requirement Assessment	Compliance Strategy	Cross Reference Index
Control of Fugitive Dust	OAC 3745-17-08 Requires the minimization or elimination of visible emissions of fugitive dust generated during grading, loading, or construction operations and other practices which emit fugitive dust.	The implementation of remedial action alternatives may require the movement of dirt and other material likely to result in fugitive dust emissions. This requirement is relevant and appropriate because the FEMP is not located in an area subject to this regulation.		
Prevention of Air Pollution Nuisance	ORC 3704.01 - .05 OAC 3745-15-07 Measures shall be taken to adopt and maintain a program for the prevention, control, and abatement of air pollution in order to protect and enhance the quality of the state's air resource so as to promote the public health, welfare, and economic vitality of the people of the state. The emission or escape into open air from any source whatsoever of smoke, ashes, dust, dirt, grime, acids, fumes, gases, vapors, odors, and combinations of the above in such a manner or in such amounts as to endanger the health, safety, or welfare of the public or to cause unreasonable injury or damage to property shall be declared a public nuisance and is prohibited.	This requirement is applicable to remediation activities involving Silo 3 material. During the remediation process some potential exists for emissions of radionuclides and toxic chemicals to the air, which might endanger individuals or damage property.		
Control of Visible Particulate Emissions from Stationary Sources	OAC 3745-17-07 Discharge of particulate emissions into ambient air from any stack of a shade or density greater than 20 percent opacity is prohibited. Transient exceedance limits are included in this regulation.	This requirement is applicable to remediation activities involving Silo 3 material. Treatment operations for various alternatives might result in the release of particulate material.		

Category	ARAR	Requirement Assessment	Compliance Strategy	Cross Reference Index
Permit to Install	OAC 3745-31-05(A)(3) The director shall issue a permit to install if he determines that the installation or modification and operation of the air contaminant source will employ the best available technology.	Since an administrative Permit to Install is not required for alternatives involving onsite treatment of Silo 3 material, this requirement is not applicable. However, the substantive requirements of this section must be met by employing Best Available Technology for treating particulate and off-gas emissions during treatment operations. Therefore, this requirement is relevant and appropriate to remediation activities involving Silo 3 material.		
Restrictions on Particulate Emissions from Industrial Processes	OAC 3745-17-11 This requirement establishes numerical emission release limits for particulate material from industrial sources. Any source (operation, process, or activity) shall be operated so that particulate emissions do not exceed allowable emission rates specified in this regulation (based on processing weights [Table 1] or uncontrolled mass rate of emissions [Figure II]). A source complies with Table 1 requirements if its rate of particulate emission is always equal to or less than the allowable rate of particulate emission based on the maximum capacity of the source: Process Rate at Maximum Capacity (lb/hr) — Allowable Rate of Particulate Emission (lb/hr)[1] 100 — 0.551 200 — 0.877 400 — 1.40 600 — 1.83 800 — 2.22 1000 — 2.58 [1]Excerpted from Table 1 of OAC 3745-17-11	This requirement is applicable to remediation activities involving Silo 3 material. Treatment operations for various alternatives might result in release of particulate material which might exceed these standards.		